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ABSTRACT

Faculty, administrators, ID staff, and graduate students involved in instructional development within higher education generated and ranked factors instrumental in the successful operation of Instructional Development Centers (IDC). Twenty factors were selected, then rated in order of perceived importance and ability to be manipulated by the administration and by the IDC. Results indicated in this initial study that factors related to administration (budgetary support, placement of the IDC in the hierarchy, and rewards to faculty); and to the IDC (skills of staff and director) are better indicators of success than factors related to IDC image and faculty skills. The factors that facilitate ID appear to evolve from the "concerns" of the individual rather than the position he holds. The model derived from this analysis provides a paradigm for decision-making in the establishment, operation and promotion of instructional development within the institution. (Author)

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FACILITATING INSTRUCTIONAL DEVELOPMENT IN HIGHER EDUCATION

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Section 10.7 Instructional Development in Higher Education

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Faculty, administrators, ID staff, and graduate students involved in instructional development within higher education generated and ranked factors instrumental in the successful operation of Instructional Development Centers (IDC). Twenty factors were selected, then rated in order of perceived importance and ability to be manipulated by the administration and by the IDC. Results indicated in this initial study that factors related to administration (budgetary support, placement of the IDC in the hierarchy, and rewards to faculty); and to the IDC (skills of staff and director) are better indicators of success than factors related to IDC image and faculty skills. The factors that facilitate ID appear to devolve from the "concerns" of the individual rather than the position he/she holds. The model derived from this analysis provides a paradigm for decision-making in the establishment, operation and promotion of instructional development within the institution.

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INTRODUCTION

Over the past ten years systems models of the instructional development process have proliferated almost at computer speed. No longer are these models the sole property of the educational technologist. At every level of education from kindergarden to higher education, administrators, teachers and even students are attempting to define teaching and learning activities in terms of systems models. Despite the somewhat inconclusive research evidence on the effectiveness of instructional development, many institutions have attempted to implement the process in order to encourage innovative alternative programs or to improve existing programs.

Two of the most commonly used systems models for instructional development (ID) have been the product development model and the organizational model. The ID product development model has been most useful to the instructional developer in giving guidance on defining instructional components such as performance objectives, pretest, instructional activities and resources, post-tests and revision of products and procedures based on empirical evidence. The second type of model provides information on organizational procedures in implementing curricular and ID services within institutions. These models, however, are most often based on information and organizational processes common only to the institution at which the model was developed. The models are more concerned with hierarchial structures and direction of authority or activity, and do not address themselves to the complex factors related to success or failure of instructional development programs.

Research is necessary into the development of a third type of instructional development models: one that can define as well as demonstrate relationships between factors that will facilitate successful ID efforts within higher education.

Several real problems in the development of such a model are immediately apparent. First, much of the information generated to date has been purely anecdotal. Success factors deemed imprtant in one given context, may not be appropriate or useful in another institutional setting with different administrative, faculty, staff and student populations.

Besides this lack of generalizability between contextual settings, a second problem is in the definition of specific success factors or variables. Each person involved in the ID process has a different perception of those variables that are important. Those factors generated by developers alone tend to stress their concerns for the purity of preserving their own ID procedures. Moreover, producers are concerned about resources, staff and equipment; faculty are concerned about their own academic control, time, and rewards; administrators are concerned about productivity and accountability of both their staff and resources; and all are concerned about their respective financial support. In order to develop a model that can examine all aspects it would be necessary to have success factors generated from all groups involved in the ID process. These numerous factors would need to be restated, and similar factors consolidated into terminology common to all groups.

A third problem in the development of a model relates to the interrelationships that exist between factors. Administrative support of an ID Center, for example, is closely related to the total budgetary support given to the Center. Any model that might be produced, therefore, should be able to show the relationships between factors, as well as their influence upon one another.

In summary, data needs to be obtained from a wide variety of subjects involved in instructional development within higher education in order to de-

fine and assess the factors that are considered crucial to the organization of ID programs. Such input could then be utilized to demonstrate the interrelationships between factors and their relative importance within existing organizational structures. The resulting model could then be used by ID staff or administrators to optimize or facilitate ID efforts within their own organizational context.

REVIEW OF LITERATURE ON INSTRUCTIONAL DEVELOPMENT MODELS

A. The Instructional Development Process

One of the most comprehensive surveys of procedures and models of systematic educational development is provided by Baker (1973). Baker cites the work of development theorists such as Banathy (1968), Borg & Hood (1968), Briggs (1970), Glennan (1967), Gilbert (1962), Glaser (1966a, 1966b), Johnson (1969), Mager & Beach (1967), McNeil (1968), Popham & Baker (1971), Schutz (1970), and Stowe (1969). New texts on the systems approach in the development of instructional materials include books by Davies (1971), Baker & Schutz (1971), Davis, Alexander and Yelon (1974), Gagné & Briggs (1974) and Gerlach & Ely (1971). Basically most instructional developers detail procedures which include the specification of behavioral objectives, pretests, selection of instructional activities, resources and environments, posttests, and the revision of materials or procedures on the basis of empirical data.

Baker (1973) makes a clear distinction between instructional product development and the "change support process" (p. 251). Product development focuses interest on the development of specific materials, while the change process orientation focuses on people and organization within education. Schutz (1970) has argued for a merger of the two approaches in order to ensure that validated instructional products gain entry into ongoing educational

organizations. Baker (1973), however, notes that procedures for "change support involves comprehensive question of organizational change, and various forms of innovations have idiosyncratic support requirements" (p. 252).

B. Research into Instructional Development

Smith and Murray (1975) conclude their study on the status of research models of product development with the statement that "there is practically no solid empirical evidence to justify the prescriptive use of development and evaluation models in instructional product development" (p. 17). The same conclusion is made by Helwig (1974) who also suggests that educational technology address itself to the whole educational system of people and organization, rather than to hardward and products alone.

Baker (1973), despite extensive research in the field herself, looks "forward to writings which did not prescribe, on the basis of faith alone, legions of procedures" (p. 277). She too suggests that inquiry is needed into procedures that are successful within particular organizational contexts.

Despite the lack of conclusive hard research evidence, whether by "faith alone", by intuition, or by experience with successful practical applications, educators are proceeding with instructional development activities on their campuses. Research must continue on the ID process to achieve more operational definitions of concepts and variables, and develop more effective tools to measure the effect of the process upon both the learner and the teacher. At the same time, however, study must be made into the complex task of facilitating ID efforts into the organizational structure of institutions of higher education.

C. Recommendations for Success in Instructional Development

Recent literature on instructional development programs in higher educa-

tion indicates some degree of consistency in advice from various sources. The following success factors are listed in the order of their apparent importance as evidenced by the frequency of their mention within the publications reviewed.

1. Committment by the institution. This general factor was discussed by the majority of authors as essential in the establishment of an effective program of instructional development on campus. Both Diamond (1974) and Purdy (1975) state that the administration is responsible for the communication on campus of problems and the need for change. Whitefield and Brammer (1973), DeBloois & Alder (1973), and Lee (1971) all stress that this support must be forthcoming from either the president or provost in charge of academic affairs. The creation of an "innovational climate" by administration is also stressed by Alexander & Yelon (1972), Diamond (1975), Lee (1972) and Purdy (1975).

Committment by the administration, however, is measured by most authors in terms of budgetary support for ID Centers: DeBloois & Alder (1973); Diamond (1975); Lee (1971, 1972); Popham (1974); Stowe (1971); and Whitefield & Brammer (1973). This specific factor is clearly the most frequent success variable cited by those ID Centers canvassed by Alexander and Yelon (1972).

Another indication of administration's committment which appears to effect the success of ID programs is the position of the ID Center within the hierarchy of the institution. In reporting on fifteen ID Centers currently in operation throughout North America, Alexander & Yelon (1972) report that the majority were operated from a central position, whereas the remainder were operated within individual Colleges or Departments. Diamond (1975) stresses the necessity for ID services to be controlled centrally with decision-making policies being made at the Vice Presidential level where communication is

clearly defined between Colleges and Departments. Lee (1972) also argues that the director should not only be given academic rank equal to faculty colleagues, but also should have the power to make policy decisions in relation to the ID projects under development. In describing their own operations, four of the fifteen Centers in the Alexander and Yelon study specifically mention the position of the ID Director in the Administrative hierarchy as an essential factor.

2. Faculty Rewards. The current reward structure in existance, particularly at older institutions of higher education, has had a strong negative influence upon efforts to improve teaching and learning. Benston (1973) repeats the common argument that faculty are rewarded for research not for teaching. Good teaching he argues, does bring a certain level of prestige to the professor, but instead of positive reward, a good teacher finds the work load is increased when improvement efforts are undertake. Benston, as well as all other authors reviewed, stress the importance of providing incentive for impovement in teaching through changes in current out-dated standards for promotion, merit, tenure, release time, etc.

3. Skills of the ID Staff. The first success factor which is related to the ID Center directly appears well down the list, after the above two factors related to the administrative structure of the campus. The most important internal factor described by most authors relates directly to the range and quality of the professional skills available to faculty at the Center. Specific skills mentioned by authors ranged from personal dynamics skills such as diagnosis of personal needs and counseling; skills required to move through the ID process such as the definition of goals, selection of strategies etc; technical skills related to the design, production and implementation of instructional materials; and skills related to the evaluation of needs, people, materials and programs: Alexander & Yelon (1972); DeBloois & Alder (1973), Diamond (1975), Lee (1972), Lindquist (1975), Purdy (1974), and Whitefield & Brammer (1973).

4. Resources and Facilities. Closely related to the "human" resources noted above, most of the same authors cite the need for physical resources and facilities. These include office, library and media resources (both hardware and software) necessary for the design, production, implementation and evaluation of new teaching resources and programs.

5. Evaluation of Programs. A smaller number of authors stress the need for programs of evaluation. Diamond (1974) sees evaluation not only as a part of the revision cycle, but also stresses a type of evaluation at the "front end". He calls for both administration and the Center to have clearly identified goals and objectives, presumably to give guidance in the selection of development projects, as well as to provide a yardstick against which to measure the final effect of the program under development. Popham (1974) stresses the need for focusing of student achievement results as a means of getting at the complex and difficult task of measuring teaching effectiveness. Both Lee (1971) and Lindquist (1974) cite overall program evaluation as another essential consideration. In the review of ID Centers by Alexander and Yelon, several Centers list evaluation of ongoing programs as a key factor, and stress the need for consistency in evaluation procedures.

6. Faculty Openness to Change. The strongest evidence of the efficacy of this factor is found in the Alexander and Yelon book. At least nine of the fifteen ID Centers mention the importance of this factor, making it second only to budgetary support as a critical factor in promoting instructional development on campus. Lindquist (1974) devotes his article to a consideration of "change models" useful in promoting innovation on the campus. Purdy (1975) states directly that the faculty's openness to change will seriously effect development efforts on campus. Both Lindquist and Purdy, however, suggest that unless faculty are involved in the charge process that efforts of administrators may be in vain.

7. Student Attitudes. Few articles directly consider the needs of students, or try to relate their attitudes to the development process. Only two of the fifteen Centers in the Alexander and Yelon book mention the importance of positive student attitudes. Diamond (1975), however, lists "a relavant curriculum" as a primary factor. He explains that the curriculum should be relevant to the present and future needs of the student, as well as to the community, society, and to existing psychological and social factors.

8. Focus of the ID Center. This factor seems to be a concern primarily of those ID Centers that have developed beyond early stages. Diamond (1975) stresses the need for the ID Center to focus on large scale projects which utilize the full range of the ID process. By selection well planned projects with good prospects for success, and by following through on all development phases at a collegial of departmental level (rather than at an individual or course level), projects have a better survivial chance as well as a better chance of having a significant effect upon wide group of learners, and faculty.
In the Alexander and Yelon book, at least one third of the ID Centers included list this level of focus as an important success variable in the operation of their ID programs.

METHOD

Instrumentation

The first step in the determination of factors that facilitate the successful operation of an Instructional Development Center was to examine existing opinion as reported in the literature. Thus, the eight factors listed above were derived. Secondly, the opinion of staff students and faculty who knew about instructional development was sought by a questionnaire (Appendix A) sent to thirty people at several institutions. Ten questionaires were returned.

Analysis of this preliminary data yielded, however, a high degree of

consistency in naming variables. Similar factors were combined, reworded, and then amalgamated with the above data taken from the literature. A pilot questionnaire composed of seventeen factors (Appendix B) was then distributed to respondents at two large north-eastern universities. Analysis of this second round of responses indicated that factors related to faculty characteristics were too limited. Other factors were not clearly worded or had no clear alternatives. For example, the issue of long range development projects needed to be balanced by a priority for small projects with quick turn-a-roud time.

The final questionnaire contained twenty factors produced by the above series of trials and pilots. Each respondent was asked to make three judgements about each factor on this final questionnaire (Appendix C). First, they were asked to rank each of the factors in order of importance from 1 to 20. Second, respondents were asked to rate each factor's potential to be manipulated by the administration of the institution. Third, respondents were asked to rate each factor again on its ability to be manipulated by the Instructional Development Center. These last two judgements were rated on a five point scale (1 representing maximum manipulation and 5 least manipulation).

Respondents.

The respondents were graduate students in Instructional Development (n=18), professional instructional developers (n=12), together with some faculty (n=8) and administrators (n=2) familiar with instructional development. They were arbitrarily chosen within two north-eastern universities practising instructional development.

Data analysis.

The three judgments made by each respondent were converted into three types of dependent measures. An analysis was udertaken separately for each of the three types of dependent measures. The three types were:

(a) the factor ranks; (b) a weighted rank for administration manipulation obtained by multiplying the factor rank by its rated manipulation potential; and (c) a weighted rank for instructional development center manipulation obtained similarly. Means for all respondents for each of the three variables are found in Appendix D.

Using an algorithmic technique developed by Ward (1963) and made available as a computer program (Veldman, 1967; Nielsen, 1975), both the factors and the respondents were grouped on their responses to examine similarities in responses among people and among factors. Grouping according to this algorithm minimizes the within-group variance and uses the measure of distance between factors or respondents in multidimensional space as an index of similarity.

Once the groups of respondents were formed on each type of dependent measure the mean profiles of the groups were contrasted. The number of groups determined by the algorithm was limited to four or less in order to facilitate meaningful comparisons in the analyses. The compositions of the groups formed by the algorithm were compared with groups formed by considering the respondent's academic rank; a chi-square test of independence was used.

For each factor in turn, the mean rank for each respondent group was compared using the modified least significant difference procedure ($p=.01$). The use of this procedure at the chosen level of significance was considered appropriate, and sufficiently conservative since each factor only contributed one twentieth to the group membership. The use of this statistic would become more questionable as the number of factors was decreased.

In order to minimize the number and types of grouping analyses, the term "clustering" will be used to refer to factors grouped according to the algorithm, and the term "grouping" to refer to respondents grouped according

the same algorithm.

RESULTS.

A. Analysis of factor rankings

1. Clustering the factors: When using the factor ranks as dependent measures, similar factors tended to cluster together according to response patterns. Thus, within the twenty factors, four clusters were produced (Table 1). The four clusters may be broadly characterized as: (1) administrative support factors; (2) instructional development policy factors; (3) campus climate factors; and (4) IDC image factors. These clusters produced through the algorithm described above were then used as the basis of the following analyses of the respondents.

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insert Table 1 about here

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2. Grouping the respondents: The respondents were first grouped according to their academic status: administrator, faculty, ID personnel, and ID student. However, in this "natural" grouping there were no significant differences between mean ranks for each factor. Respondents were then grouped by the algorithm, this process produced three separate groups of respondents. Membership in Group A, B, or C was defined by the algorithm as a similarity in response patterns over the twenty factors on the questionaire. When membership of algorithm groups were compared with status groups no significant trends in membership were apparent (Chi-square 4.96, df=6, p=.55). Thus, none of the groups formed by the algorithm could be said to be representative of a particular academic group.

Although the status group mean ranks on factors showed no significant differences, the algorithm groups showed differences (p=.01) on a number of factors (## 3, 4, 6, 12, 14, 15, 18, 20; see Table 2).

Insert Table 2 about here

On examination of the response plots of the respondents in groups A,B, and C (Figures 1 through 4), it can be seen that each group rates one cluster of factors more favorable than the other two. In these four figures the mean factor ranks on the vertical axis represent the twenty original factors, thus the lowest mean rank indicates the most highly favored factor. In Figure 1 it is evident that those respondents who favor factors related to the administrative support cluster can be seen as members of a group (B) that responds consistently. In Figure 2 another group of respondents favor factors related to the ID policy cluster (C); and in Figure 3 a third group of respondents favor factors related to the institutional climate cluster (A). In Figure 4, however, respondents show no such consistency in favoring factors related to campus ID image. With only three factors in this cluster, it is perhaps difficult to obtain any overall pattern.

On the basis of this analysis it can be tentatively suggested that groups formed by the grouping analysis tend to respond on the basis of the values and concerns of the person rather than by position and function he or she holds within the organization. Thus, a description of group characteristics by status appears less useful in determining the main concerns of the members of each group than description based upon algorithmic grouping. The latter allows the isolation of an individual member's concerns and also appears to isolate the potential motivating concerns within the university community.

Insert Figures 1 to 4 about here

B. Analysis of ranks weighted for administrative manipulation

1. Clustering the weighted factors: When using the first weighted average as a dependent variable (factor rank multiplied by the rating for the administrative manipulation), three clusters of factors were generated by the algorithm. These new clusters were not dissimilar to those clusters obtained under the analysis of the factor rankings. The first cluster involved factors related to administrative support and policy; the second cluster involved factors related to institutional climate; and the third cluster involved factors related to both IDC image and faculty skills.

The clusters appear to group around traditional beliefs of respondents about administration and policies. Thus, administrators are viewed as being more concerned with policy than with institutional climate and even less with the IDC image and faculty skill factors. In many respects these three clusters represent factors that range on a continuum (central to peripheral) of administration concerns.

2. Grouping the respondents: When subjects were grouped on the basis of the administrative manipulation weighted factor ranks, two main groups emerged (X, n=21; Y, n=18). These groups were not composed of the same respondents as in the previous analysis of factor ranks; only 50% of each group was grouped together previously. These groups were again not characterized as representing any particular academic status groups (Chi-square=6.38, df=6, p=.383). From an analysis of the profiles, group Y in this analysis was more concerned with administrative issues than group X (Figure 5), while group X was more concerned with factors related to institutional climate (Figure 6). Although not statistically significant, the two administrators in the sample fell in group Y. When the respondents were grouped on their administration-weighted ranks three groups were in fact formed. Group Z, the third group contained only one respondent whose profile was so dissimilar that he was maintained in his own group by the

algorithm. This respondent (an instructional developer) tenaciously rated IDC image and faculty skills factors more highly than the other two groups. He also rated these same factors more highly than the other two clusters of factors.

As with the previous analysis the sample can be characterized by its responses although the mean ranks of groups X and Y only differed significantly on two factors (## 14 and 18, p=.01). Group Z differed significantly from both groups X and Y on five factors ## 3, 10, 11, 12, 15) and from group X on two additional factors (## 13 and 14).

C. Analysis of ranks weighted for IDC manipulation.

1. Clustering the weighted factors: When second weighted average was used as a dependent variable (factor ranks multiplied the rating for the IDC manipulation), the grouping algorithm produced two clusters of items. One cluster might be termed internal IDC related factors (## 1, 3, 4, 6, 8, 10, 11, 12, 13, 16, 17, 19); while the second cluster might be termed external to IDC (ie. campus wide) factors (##, 2, 5, 7, 9, 14, 15, 18, 20). This interesting dichotomy between the two groups reflects a distinction easily made by an instructional developer looking at his/her environment or an outsider looking at the IDC in relation to its Campus context.

2. Grouping the respondents:

When the respondents were grouped on the basis of their weighted ranks, two groups were formed (P, n=31; Q, n=9). These groups again did not form on academic status lines (Chi-Square=2.1, df=3, p=.57). Eight members of group Q were included in group X in the administration weighted rank analysis (with the additional member being the renegade from group Z). Eight members of group Q were also previously included in group A in the initial factor rank analysis. In both previous analysis the members of group Q were associated with

others that ranked climate factors as most important. In this analysis group Q members tend to favour external factors, hence they might be characterized as interested in relationships and factors outside an IDC. The larger group P (n=31) might be characterized as IDC centered. This group is primarily interested in the manner in which the center operates and is supported by the administration. Using the modified least significant difference procedure (p=.01), significant contrasts between these two groups were found for six of the factors (## 1, 6, 9, 10, 11, 14).

DISCUSSION

The factors generated through the study appeared to be adequate to elicit specific attitudes from respondents and were useful in sorting them into groups. Further study, however, is needed on the definition of the factors so as to be able to place each specifically into definite categories. Each factor also needs to be re-examined for operational definition. For example, factor #2, "administration's support of the IDC" was vague and did not include specific reference to the nature of support as did ## 12, 15, 20.

The results of this preliminary study suggest a re-evaluation of the common conception of the concern's of various individuals within higher education about instructional development activities. Catagorization of an individual's concerns according to academic status appears to be inadequate. Instead of this standard grouping technique, this study seems to indicate a more appropriate grouping of individuals would be according to the similarity of their response patterns. It might also be conjectured that identification of these groups might also allow the bringing together of individuals who could work together harmoniously to facilitate instructional development programs.

Generally, there appear to be three main styles or concerns that identify different groups: first, those concerned with administrative support factors; secondly, those concerned with instructional development policy factors; and thirdly, those concerned with institutional climate factors. The weight of factors depending upon the degree of manipulability by either administration or the IDC provided an insight into those factors for which a particular group felt responsibility. For example, although some group differences were observed when ranks were weighted on administrative manipulation, both groups ranked the clusters of factors related to administrative support and ID policy higher than the clusters of factors related to climate, faculty, skills, or IDC image.

Future studies should also include more respondents from a wider population base representing a wider variety of institutions, and levels of academic status than was obtained in the present sample. However, if the response patterns are maintained in subsequent studies, and similar groups are formed, then the instrument and procedures developed in this study appear to be able to predict the types of factors that concern each member of the algorithmic groups, independent of either the institution or the academic status of the respondent.

The graphic display of a model that can illustrate the interrelationship of factors that facilitate instructional development is most difficult to plot at this early stage. Three different rankings were analyzed in this study and respondents' priorities shifted depending upon their perception of manipulative power within the institution. As a beginning, the inter-relationships between factor ranks alone are demonstrated by a systems diagram (Figure 8). In this diagram the essential clusters of factors derived from the grouping algorithm are maintained. Arrows between factors indicate direction of influence. The changing focus of concerns with weighted ranks (administrative of IDC manipulation) is demonstrated by asterisks beside the three most favored factors in each category.

While the generalizability of this preliminary model cannot be assured at this time, the technique for producing the model seems to have implications for assessing attitudes towards instructional development wherever the procedures are utilized. By administering the questionaire (Appendix C) individuals with similar "concerns" within the institution might be grouped by the algorithm technique. Once the key factors are clustered, model might be produced. Such a model could then account for the inter-relationships of factors as they related to the specific organizational context of the given institution. Besides isolating high priority factors, this technique could also provide a means of

predicting a given individual's support or committment toward a particular factor.

This study also seems to indicate that there may be some danger in one group(either status or algorithm) focusing on one cluster of factors as most essential in promoting instructional development. The analysis of responses to the IDC manipulation weighted factor ranks supports this view. If a group views its authority as only being able to manipulate factors within the IDC, then that group can become primarily concerned with issues such as staff size, skills, quality of products. None of these factors, however, are considered very important in the administrative manipulation weighted factor ranks. An IDC that concentrates on these factors alone, without concern for external administrative policy and campus attitudes may find itself isolated and without the support of administration of faculty.

In summary, the factors that influence instructional development in higher education appear, in the sample chose, to be largely determined by the "concerns" of the individual respondents. The factors cluster together in line with these concerns. Groups identified through the algorithm in this study tended to have more consistency in favoring specific clusters of factors than did traditional groups defined by academic status. The development of a model to both define key factors and demonstrate inter-relationships between factors that can facilitate instructional development has been suggested. The chief problem in defining any such model lies in the shifting focus of concern depending upon the viewpoint of any individual in relation to his/her role in the instructional development process. In the meantime, however, an awareness of the main factor clusters and of how the ID staff, faculty and administration view their role in the ID process can be achieved by the techniques described in this study. Top priority factors demonstrated in this study were seen as

those in cluster 1: administration's support through budgetary support, the placement of the IDC in the institution's hierarchy, and rewards for faculty; and IDC related factors such as the skills of the staff, Director, and the quality of the products produced.

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Table 1 Clusters of factors grouped on the basis of factor ranks.

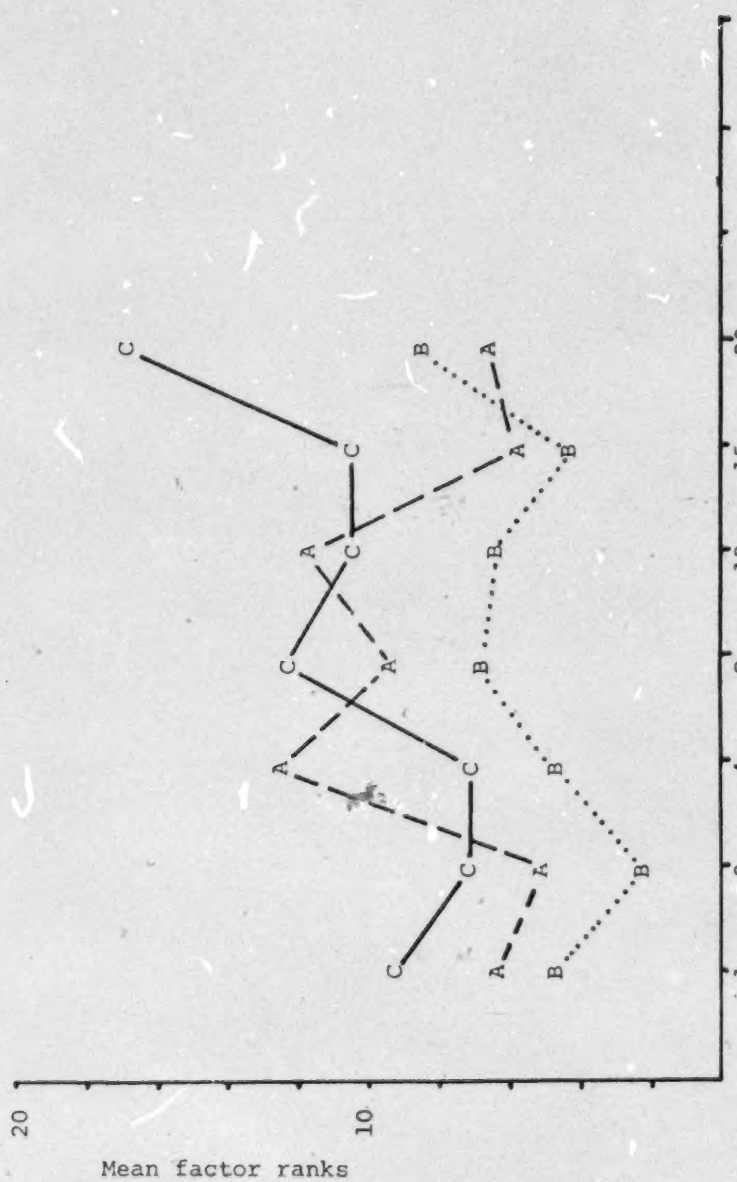
Cluster	Type	Factor numbers (refer to appendix C).
1	Administrative and staff	1 2 4 8 12 15 20
2	Policy toward instructional development	3 6 10 11 13
3	Climate	5 7 9 14 18
4	Image	16 17 19

Table 2 Significant contrasts on mean factor rankings using the modified least significant difference procedure (p=.01).

Factor number	Significant contrasts between groups*
3	A with C; B with C
4	A with B
6	A with C
12	A with B
14	A with B
15	B with C
18	A with B; A with C
20	A with C; B with C

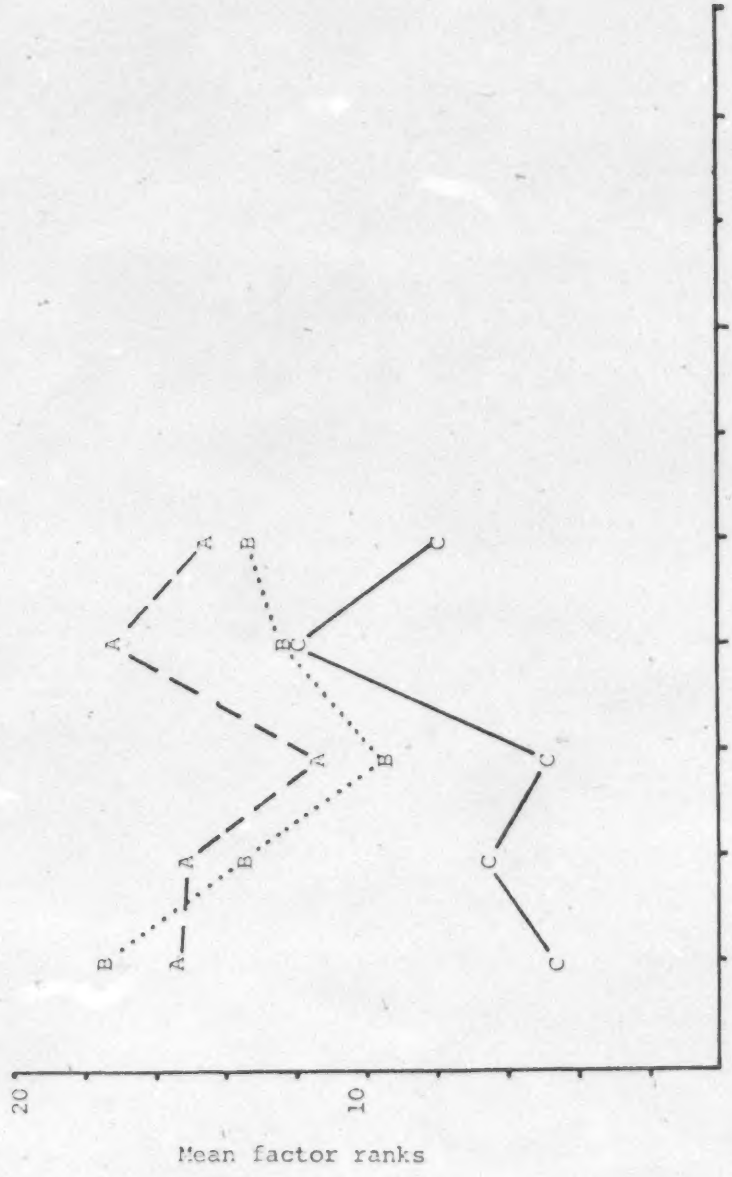
* The letters A, B, C refer to the groups formed by the algorithm and plotted in figures 1 through 4.

Figure 1.



Mean factor ranks for groups on administrative support factors.
Group A (n=14), Group B (n=21), Group C (n=5)

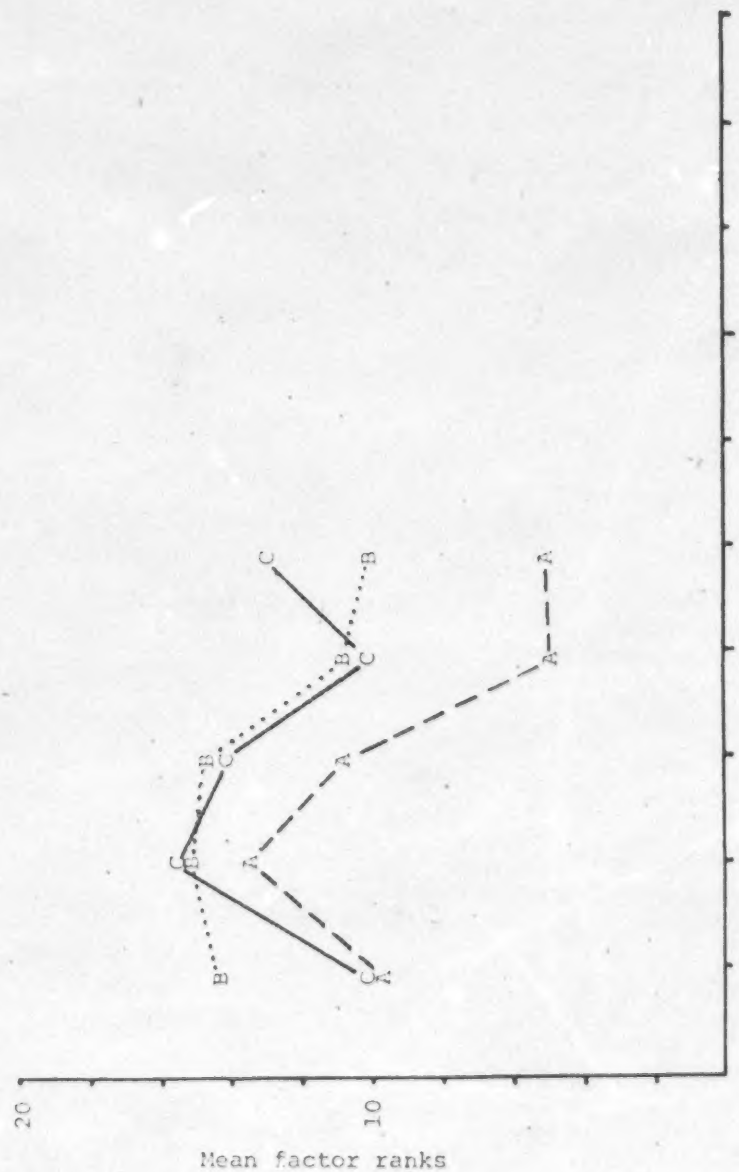
Figure 2.



Mean factor ranks for groups on ID policy factors.

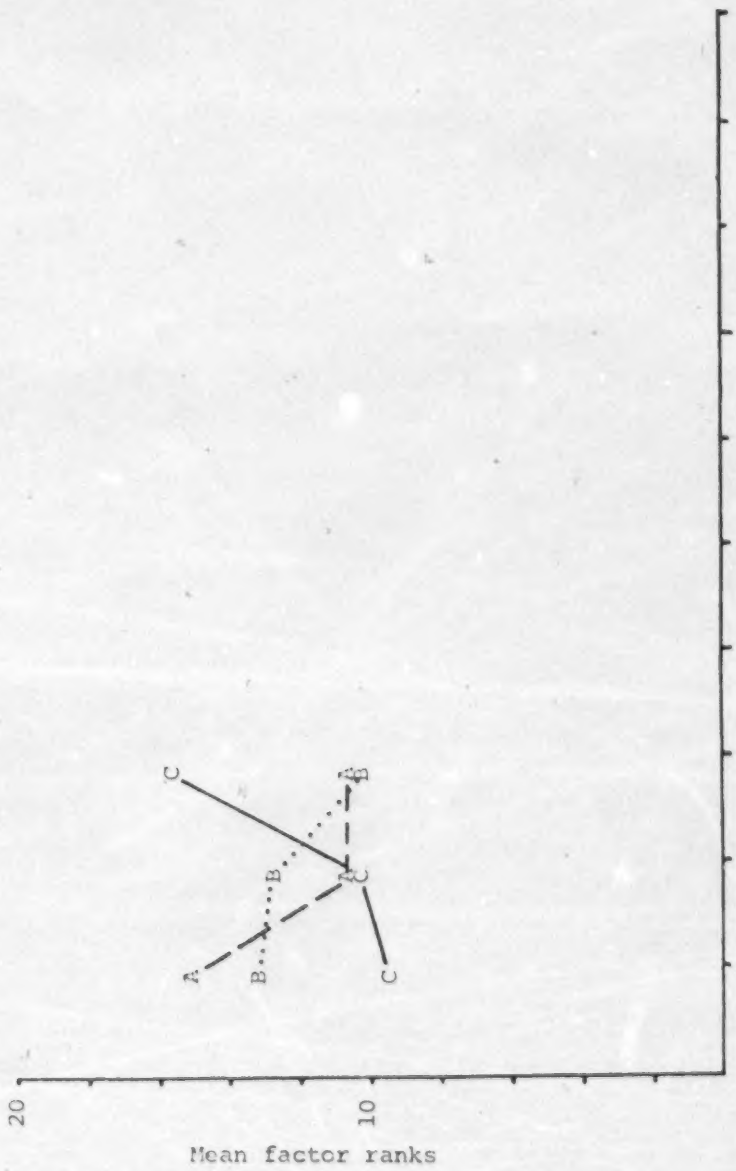
Group A (n=14), Group B (n=21), Group C (n=5)

Figure 3.



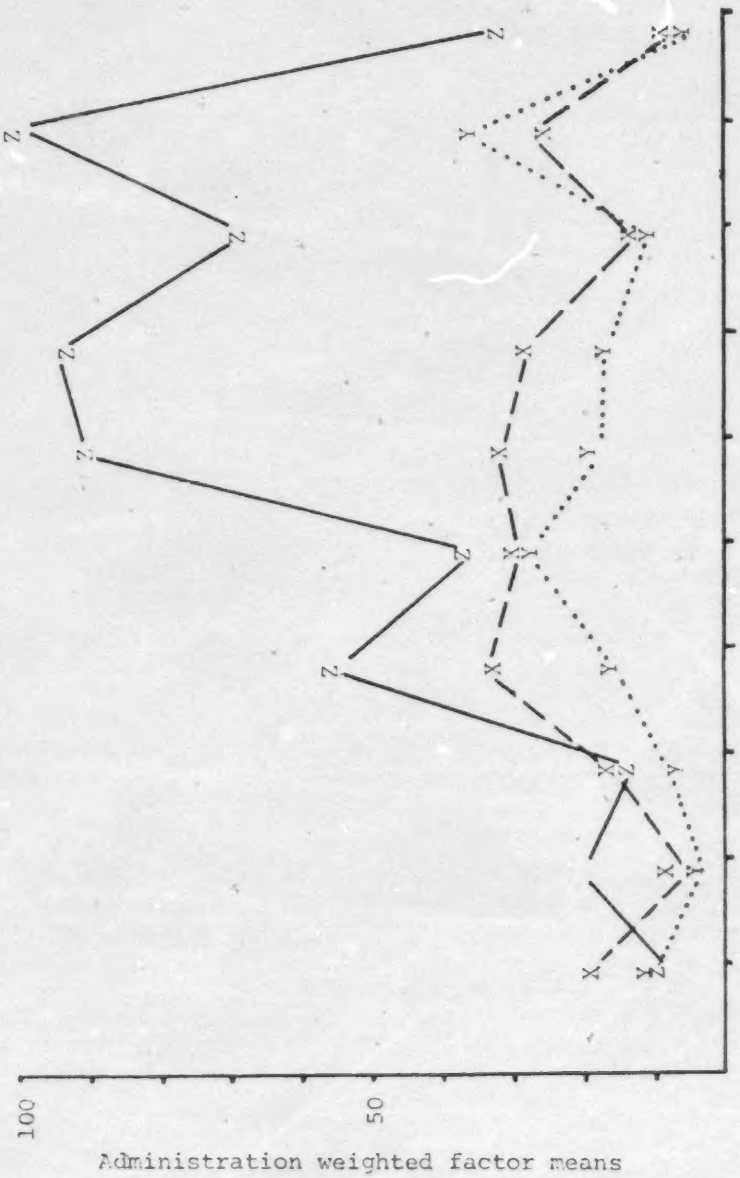
Mean factor ranks for groups on institutional climate factors.
Group A (n=14), Group B (n=21), Group C (n=5)

Figure 4.



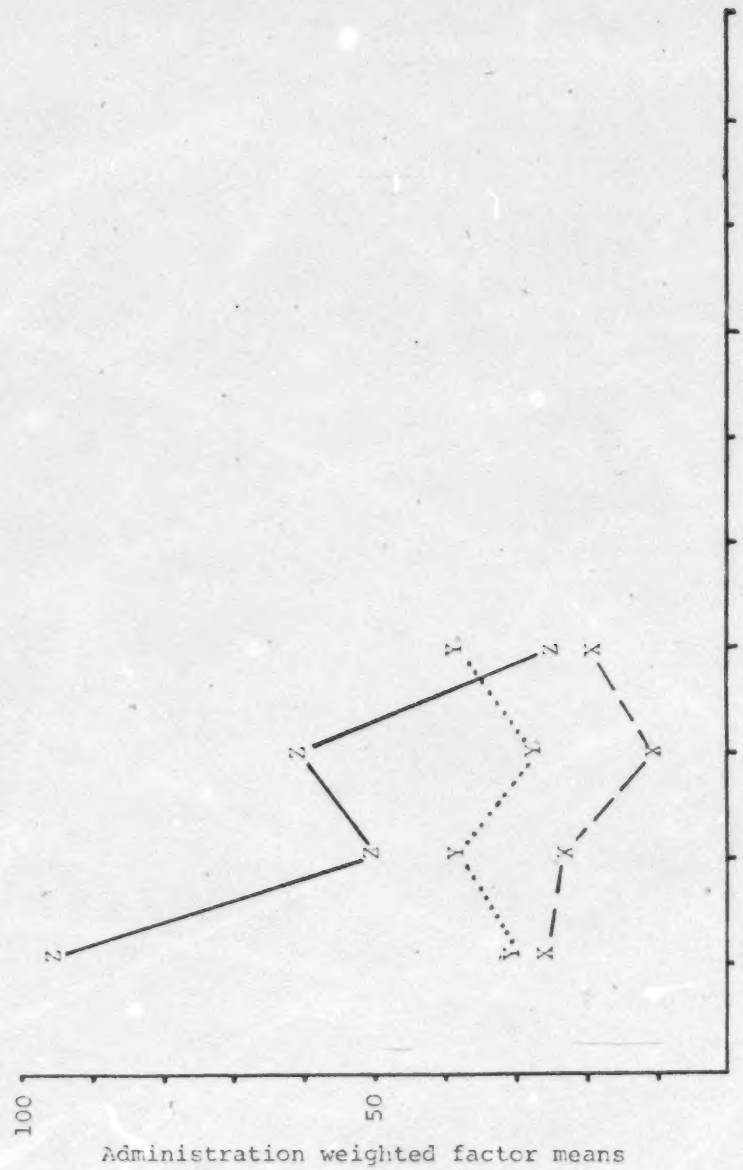
Mean factor ranks for groups on IDC image factors.
Group A (n=14), Group B (n=21), Group C (n=5)

Figure 5.



Mean factor ranks for groups on administration and policy factors.
Group X (n=21), Group Y (n=18), Group Z (n=1)

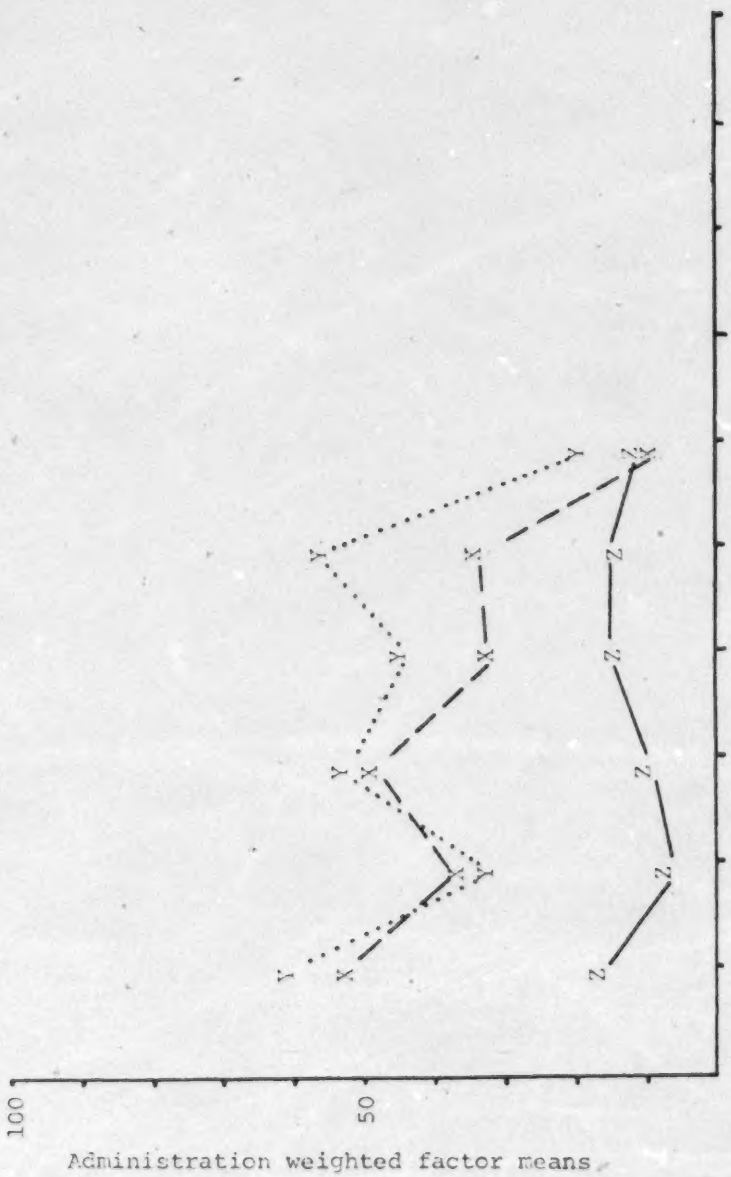
Figure 6.



Mean factor ranks for groups on institutional climate factors.

Group X (n=21), Group Y (n=18), Group Z (n=1)

Figure 7.



Mean factor ranks for groups on IDC image and faculty skills factors.
Group X (n=21), Group Y (n=18), Group Z (n=1)

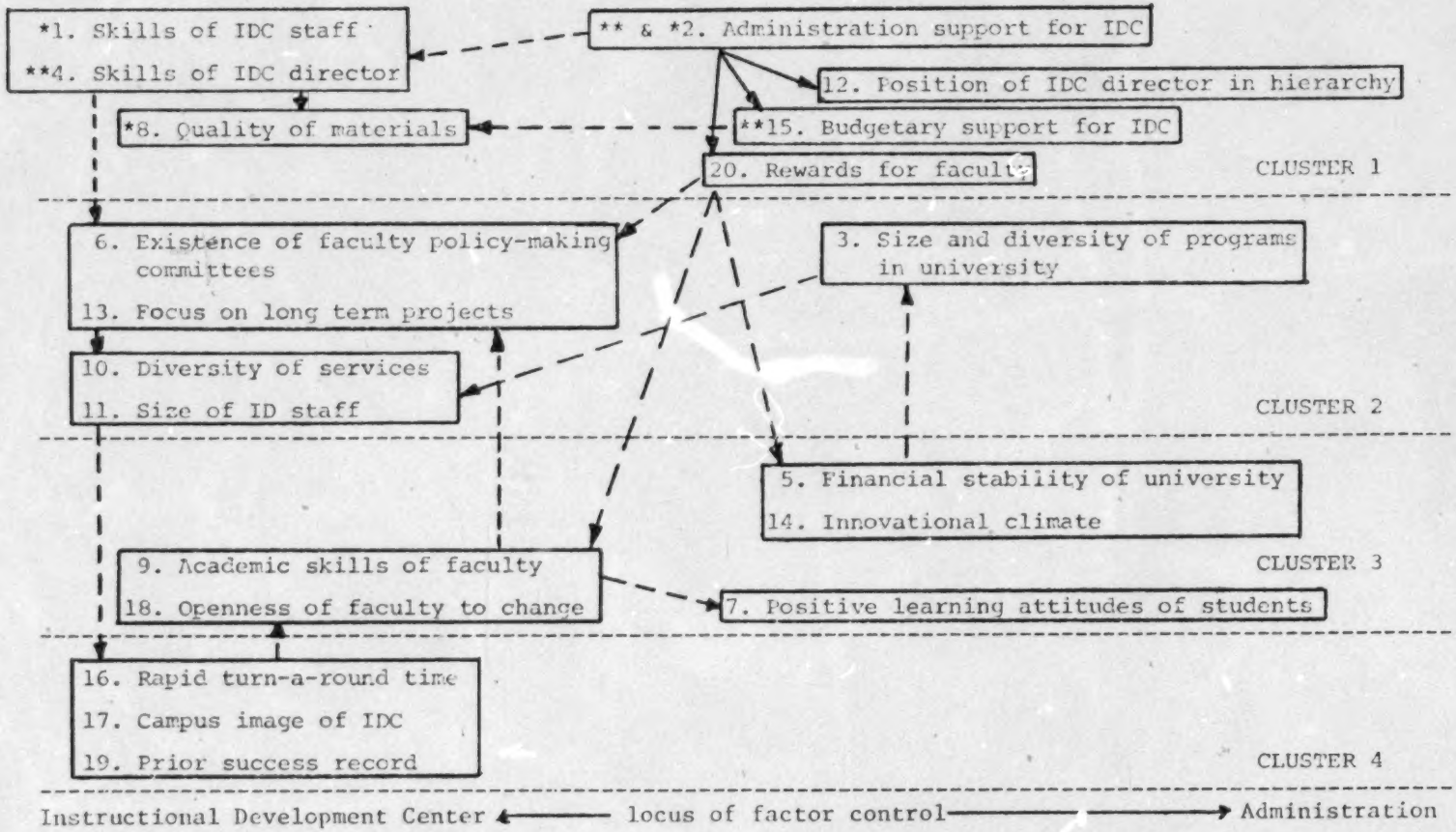

*1. Skills of IDC staff
**4. Skills of IDC director
** & *2. Administration support for IDC
12. Position of IDC director in hierarchy
*8. Quality of materials
**15. Budgetary support for IDC
20. Rewards for faculty
CLUSTER 1
6. Existence of faculty policy-making committees
13. Focus on long term projects
3. Size and diversity of programs in university
10. Diversity of services
11. Size of ID staff
CLUSTER 2
5. Financial stability of university
14. Innovational climate
9. Academic skills of faculty
18. Openness of faculty to change
CLUSTER 3
7. Positive learning attitudes of students
16. Rapid turn-a-round time
17. Campus image of IDC
19. Prior success record
CLUSTER 4
Instructional Development Center
locus of factor control
Administration

Figure 8. Interrelationship of factors. (Dotted arrows indicate direction of influence)

* indicates that the factor is high priority for IDC weighted ranks
** indicates that the factor is high priority for Administration weighted ranks

APPENDIX A.

FACILITATING INSTRUCTIONAL DEVELOPMENT IN HIGHER EDUCATION

DELPHI PANEL

TASK ONE: List below all those factors that you consider important in the successful operation of an institutional Center for Instructional Development. You may use additional paper, if needed.

When your list is comple, indicate your name and institution at the bottom, and return at your earliest convenience to: Dr. Robin Lawrason, Media Learning Center, Temple University (envelope provided).

Completed by _____ Institution_____

Position _____

APPENDIX B.

Project to Identify Factors Influencing Instructional Development in Higher Education

Initial results to the first open-ended questionnaire indicate the following factors as being among the most important. Read all these over, and decide which you feel is the most important. You may add other factors at the bottom or on the back of this page.

FIRST: RANK the factors in the order you believe most important in terms of making instructional development work on campus (1 most important).

NEXT: RATE each factor's ability to be manipulated by an instructional development center. Use a scale of 1 to 5 (little manipulation possible to maximum manipulation possible).

Factor	Rank Importance	Ability to be manipulated
Financial stability of the institution		
Administration's support of the Center		
Innovational climate of the institution		
Budgetary support for the Center		
Opennessof faculty to change		
Rewards provided for faculty for ID work		
Campus image of the ID Center		
Position of the IDC & Director within institution		
Skills of the ID Director (ID & personal)		
Size of the ID staff		
Skills of the ID staff		
Range of IDC services available to faculty		
Prior success record of the IDC		
Quality of the completed products		
Continuation of projects started through systematic evaluation and refunding		
Size and diversity of the insitituion's programs		
Positive attitudes of students.		

Name _____ Position _____

APPENDIX C

Project to Identify Factors Influencing Instructional Development in Higher Education

Instructional development is generally defined as a systematic process which is employed in the design, production, and evaluation of instructional materials. The process involves analysis of curriculum goals and objectives, learner characteristics, appropriate teaching methods, and optimal learning resources.

From your particular role within the university (administrator, faculty, instructional developer, ID graduate student etc.) examine the following factors which influence the successful operation of instructional development in higher education. Then...

FIRST: *RANK* the factors in the order you believe most important in terms of making instructional development work on campus. Rank factors 1 to 20.

SECOND: *RATE* each factor's potential to be manipulated by an instructional development center. Use a scale of 1 to 5 (1 representing maximum manipulation possible, and 5 for a factor that is not easily manipulated).

THIRD: *RATE* each factor again on its ability to be manipulated by the administration of the university. Use the same 1 to 5 scale.

Factors	1. Rank (1-20)	2. IDC manpltn (1-5)	3. admin manpltn (1-5)	
1. Skills of the Instructional Development Center (IDC) staff				
2. Administration's support of the IDC.				
3. Size & diversity of the academic programs offered by the university				
4. Skills (ID & personal) of the ID director				
5. Financial stability of the university				
6. Existence of faculty policy-making committee(s) on operation of I.D. services.				
7. Positive learning attitudes of students				
8. Quality of the completed instructional materials				
9. Academic skills of the faculty				
10. Diversity of services available to faculty through the IDC.				

see page 2

Factor	1. Rank	2. IDC manptn	3. admin manptn	
11. Size of ID staff				
12. Position of the IDC & director within the heirarchy of the institution				
13. Focus on long term large scale curriculum projects.				
14. Innovational climate of the university				
15. Budgetary support for the I.D.C.				
16. Rapid turn around time for day to day instructional materials production				
17. Campus image of the I.D.C.				
18. Openess of faculty to change				
19. Prior success record of the I.D.C.				
20. Rewards provided for faculty for time & works spent on I.D. activities				

PLEASE COMPLETE FORM AT YOUR EARLIEST CONVENIENCE AND RETURN IT IMMEDIATELY TO:

at Temple University:
Dr. Robin Lawrason
Media Learning Center
Humanities Building

at Syracuse University
Mr. John Hedberg
Area of Instructional Technology
Huntington Hall #115

APPENDIX D.

Means Scores and Rankings for Factors

Factors Factor	Rank mean	Rank rank	IDC manpltn mean	IDC manpltn rank	Admin manpltn mean	Admin manpltn rank
1. Skills of the IDC staff	5.87	3	9.05	1	15.4	6
2. Administration's support of the IDC	3.9	1	12.33	3	4.78	1
3. Size & diversity of University's program	14.95	20	61.98	20	28.53	12
4. Skills of the ID director	7.73	4	19.9	6	13.1	3
5. Financial stability of the university	12.18	13	56.63	18	29.78	13
6. Faculty policy making IDC committee	13.15	15	34.37	15	26.93	10
7. Positive learning attitudes of students	14.9	19	49.3	17	54.9	20
8. Quality of instructional materials	8.47	5	11.28	2	30.13	14
9. Academic skills of faculty	12.95	14	58.03	19	33.48	15
10. Diversity of IDC services to faculty	9.47	10	18.83	5	27.43	11
11. Size of ID staff	14.1	18	39.6	16	25.35	8
12. Position of IDC & Dir in hierarchy	8.6	6	29.43	12	14.08	4
13. Focus on long term projects	13.33	17	33.7	14	33.73	16
14. Innovational climate of university	8.6	6	28.03	11	18.85	7
15. Budgetary support for IDC	5.53	2	16.68	4	7.28	2
16. Rapid turn around time on daily Productn	13.25	16	21.13	7	48.75	19
17. Campus image of IDC	11.63	12	23.75	8	35.98	17
18. Openess of faculty to change	8.63	8	30.98	13	25.73	9
19. Prior success record of IDC	10.83	11	26.68	9	43.0	18
20. Rewards for faculty for ID work	8.88	9	27.03	10	14.4	5